WHAT IS CLAIMED IS:

1. An image matching device for at least one of automatically estimating motion in a motion picture and automatically detecting a corresponding point between stereo videos formed of a left eye and right eye images, comprising:

matching means for performing a matching processing upon a video;

characteristic amount extraction means for extracting a characteristic amount of a matching information signal (vector) output from the matching means; and

conversion parameter determination means for determining a parameter for a motion estimation processing upon an input video or a parameter for a detection processing of the corresponding point between the left eye and right eye images based on the characteristic amount,

wherein the matching means performs the matching processing by using the parameter determined in the conversion parameter determination means.

2. An image matching device for at least one of automatically estimating motion in a motion picture and automatically detecting a corresponding point between stereo videos formed of a left eye and right eye images, comprising:

matching means for performing a matching processing upon a video;

characteristic amount extraction means for extracting a characteristic amount from the contents of the video; and

conversion parameter determination means for determining a parameter for a motion estimation processing upon the input video or a parameter for a detection processing of the corresponding point between the left eye and right eye images,

wherein the matching means performs the matching processing by using the parameter determined in the conversion parameter determination means.

3. The image matching device according to claim 1, wherein the matching means performs the image matching processing by an iterative gradient method in which a differential vector calculated based on a horizontal and vertical gradients of a pixel value and the difference between motion-compensated fields (frames) by the initial displacement motion vector is multiplied by the conversion parameter determined in the conversion parameter determination means and the result of multiplication is added to the initial displacement motion vector, so that a vector is obtained.

4. The image matching device according to claim 2, wherein the matching means performs the image matching processing by an iterative gradient method in which a differential vector calculated based on a horizontal and vertical gradients of a pixel value and the difference between motion-compensated fields (frames) by the initial displacement motion vector is multiplied by the conversion parameter determined in the conversion parameter determination means and the result of multiplication is added to the initial displacement motion vector, so that a vector is obtained.

5. The image matching device according to claim 1, wherein the matching means performs the image matching processing by an iterative gradient method in which a number is added to or subtracted from a differential vector calculated based on a horizontal and vertical gradients of a pixel value and the difference between motion-compensated fields (frames) by the initial displacement motion vector and the resultant added or subtracted value is added to the initial displacement motion vector, so that a vector is obtained.

6. The image matching device according to claim 2, wherein the matching means performs the image matching

processing by an iterative gradient method in which a number is added to or subtracted from a differential vector calculated based on a horizontal and vertical gradients of a pixel value and the difference between motion-compensated fields (frames) by the initial displacement motion vector and the resultant added or subtracted value is added to the initial displacement motion vector, so that a vector is obtained.

7. The image matching device according to claim 3, wherein the matching means comprises means for determining whether or not a denominator when calculating the differential vector calculated based on a horizontal and vertical gradients of a pixel value and the difference between motion-compensated fields (frames) by the initial displacement motion vector is smaller than a predetermined threshold, and the conversion parameter is determined so that a degree of contribution of the differential vector is small if the denominator is smaller than the threshold.

8. The image matching device according to claim 4, wherein the matching means comprises means for determining whether or not a denominator when calculating the differential vector calculated based on a horizontal and vertical gradients of a pixel value and the difference

between motion-compensated fields (frames) by the initial displacement motion vector is smaller than a predetermined threshold, and the conversion parameter is determined so that a degree of contribution of the differential vector is small if the denominator is smaller than the threshold.

9. The image matching device according to claim 5, wherein the matching means comprises means for determining whether or not a denominator when calculating the differential vector calculated based on a horizontal and vertical gradients of a pixel value and the difference between motion-compensated fields (frames) by the initial displacement motion vector is smaller than a predetermined threshold, and the added or subtracted number is determined so that a degree of contribution of the differential vector is small if the denominator is smaller than the threshold.

10. The image matching device according to claim 6, wherein the matching means comprises means for determining whether or not a denominator when calculating the differential vector calculated based on a horizontal and vertical gradients of a pixel value and the difference between motion-compensated fields (frames) by the initial displacement motion vector is smaller than a predetermined threshold, and the added or subtracted number is determined

so that a degree of contribution of the differential vector is small if the denominator is smaller than the threshold.

11. The image matching device according to claim 1, wherein the characteristic amount of the matching information signal (vector) is a variance of a vector.

12. An image matching method for performing an image matching by using an iterative gradient method which iteratively estimates at least one of motion or parallax of a video on a block-by-block basis based on an initial displacement vector, comprising the step of:

forming a plurality of small blocks by dividing the block into small blocks and applying the iterative gradient method to each of the small blocks to calculate the motion or parallax for every small block.

13. The image matching method according to claim 12, wherein motion vectors for neighbor blocks of the block are determined as motion vector candidates for the initial displacement vector of the small block and the initial displacement vector of the small block is selected from among the motion vector candidates.

14. The image matching method according to claim 13, wherein the motion vector candidates include motion vectors for a block in a previous frame corresponding to the block and for neighbor blocks thereof.

15. The image matching method according to claim 13, wherein the motion vector candidates include at least one of the motion vectors for the neighbor blocks of the block, a motion vector for a block in the previous frame corresponding to the block and a motion vector obtained by calculating motion vectors for neighbor blocks thereof.

16. An image matching device which performs an image matching by using an iterative gradient method for iteratively estimating at least one of motion and parallax of a video on a block-by-block basis based on an initial displacement vector, comprising:

an initial displacement vector determination section for determining the initial displacement vector for a small block obtained by dividing the block into a plurality of blocks; and

a second iterative gradient method performing means for calculating the motion vector of the small block based on the initial displacement vector determined in the initial displacement vector determination section.

17. The image matching device according to claim 16 further comprising a first iterative gradient method performing means for calculating the motion vector for the video block,

wherein the initial displacement vector determination section comprises:

a vector memory for storing a motion vector for at least one of blocks in the current and previous frames calculated by the first iterative gradient method performing means; and

an initial displacement vector selecting section for selecting the initial displacement vector of the small block from among motion vectors of neighbor blocks of the corresponding block read out from the vector memory.

18. The image matching device according to claim 17, wherein the initial displacement vector determination section further comprises a calculation section for calculating the motion vector read out from the vector memory to obtain the motion vector candidates, and at least one of motion vectors of neighbor blocks of the corresponding block read out from the vector memory and the motion vector as the result of calculation is determined as the motion vector candidates and thus the initial displacement vector of the small block is determined from among the motion vector candidates.